

Keep the Skies Dark over Marlborough

Introduction to the Dark Skies Movement:

The Dark Skies movement globally has started communities looking at light pollution and the negative impact this has on the health, well-being and safety of both people and wildlife. Dark Sky reserves and sanctuaries are being set-up across New Zealand, with Wairarapa, Aotea / Great Barrier, Aoraki / McKenzie and Rakiura / Stewart Island being recent examples of Dark Sky Reserves being established.

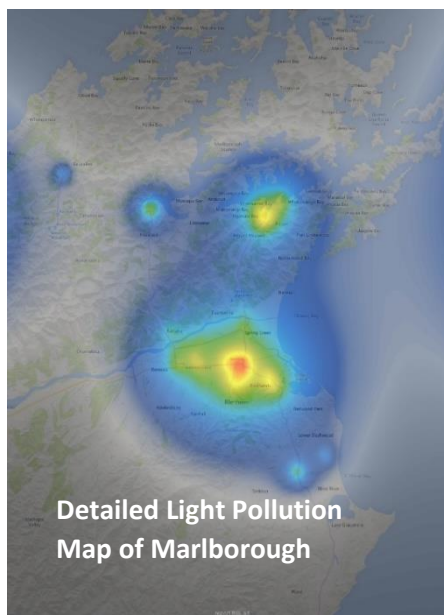
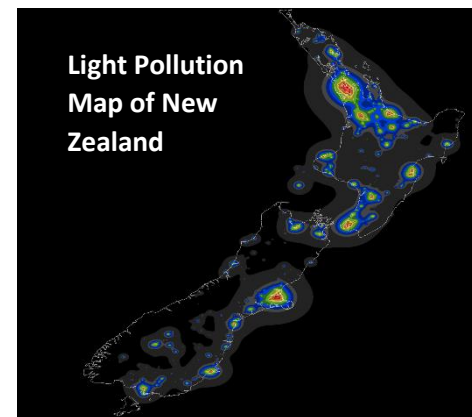
Dark Sky communities also see savings on their power bills through cutting energy usage, as well as the economic benefits of dark sky tourism. Most of the Marlborough area has amazing dark skies, however each year this is slowly being reduced. Our submission is to ask the Council to support a Dark Skies group, to investigate the benefits for the region and look to join up with the planned Dark Sky reserve being set-up in Kaikoura.

Introduction to Light Pollution:

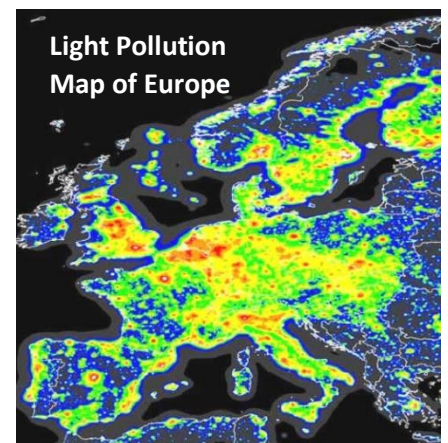
This is an image of the core light pollution in New Zealand¹, with areas of black being no pollution, blue low pollution, green mid-levels, yellow high, and red extreme.

Marlborough (below in detail) is currently fortunate to have a large amount of the region currently able to be classified as a Dark Sky. From our initial research we think 60% of Marlborough (approximately 6,000 km² of the region) could easily be classified as Dark Sky.

Human illumination of the planet is increasing by 2% per year globally. What we are proposing is to protect the amazing darks skies of our region for generations to come.



Compare New Zealand to Europe, where even remote areas have considerable light pollution. For example, the Omaka Observatory location on Dog Point Road has equivalent or better dark skies than most dark sky reserves in Europe and this is nowhere near as good as areas such as the Molesworth.



The Observatory has had visitors who have never seen the Milky Way (something clearly visible at our site), some of these visitors have come from overseas, others from New Zealand main centres (Auckland, Wellington, Christchurch etc).

¹ <https://www.lightpollutionmap.info>

What is a Dark Sky Reserve?

The International Dark Sky programme manages global certification and has different categories. We would be looking to create dark sky parks for areas such as the Molesworth, dark sky reserves around other rural areas, and dark sky communities where positive community engagement exists. Community engagement is essential, and we feel that some communities will want to come on-board and some-not, so would look certainly initially to engage with communities wanting to preserve their night sky. We note there is an Annual Plan submission from the Wairau Valley Ratepayers and Residents Association on this subject.

The International Dark Sky Places Program five certification categories:

- 1) International Dark Sky Sanctuaries
Sanctuaries are the most remote (and often darkest) places in the world whose conservation state is most fragile.
- 2) International Dark Sky Parks
Parks are publicly- or privately-owned spaces protected for natural conservation that implement good outdoor lighting and provide dark sky programs for visitors.
- 3) International Dark Sky Reserves
Reserves consist of a dark “core” zone surrounded by a populated periphery where policy controls are enacted to protect the darkness of the core.
- 4) Urban Night Sky Places
Urban Night Sky Places are sites near or surrounded by large urban environs whose planning and design actively promote an authentic night-time experience in the midst of significant artificial light at night.
- 5) International Dark Sky Communities
Communities are legally organized cities and towns that adopt quality outdoor lighting ordinances and undertake efforts to educate residents about the importance of dark skies.

Why create a dark sky reserve in Marlborough?

There are many reasons why a dark sky reserve makes sense for the region, in addition to protecting the night sky.

Light pollution wastes energy and money.

35% of light is wasted through unshielded and/or poorly aimed outdoor lighting, the same lighting result can be achieved with better planning / more effective lighting. It is estimated that the region is wasting \$82,500 per year ² on energy through bad outdoor lighting.

² <https://www.darksky.org/wp-content/uploads/2021/01/Light-Pollution-Wastes-Energy-and-Money-English.pdf>

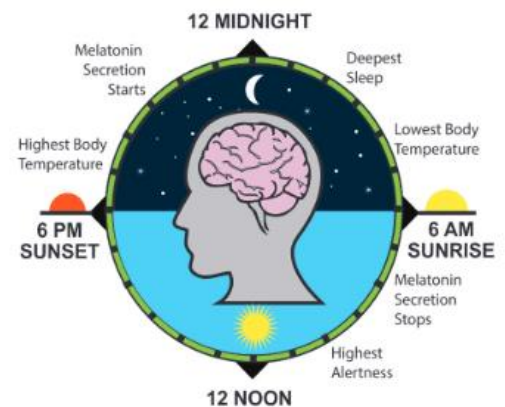
Good vs. Bad Lighting

This photo (right) shows examples of good and poor lighting design. The unshielded light fixture on the left throws light into the sky and creates glare, impairing visibility. The shielded light fixture on the right directs light to the ground where it is needed and does not create lighting pollution. To learn about light fixtures that are environmentally friendly, energy efficient and certified with the IDA Fixture Seal of Approval, visit darksky.org.



Improvements to Human Health

Research has shown that humans evolved with a circadian rhythm (our master clock). This interacts with our body systems, changes our hormone levels and even our genetic code. It uses the natural day / night cycle to achieve this. Research shows that disruption to the circadian rhythm³ can cause impaired sleep quality and insomnia as well as increases in hypertension (blood pressure issues), myocardial infarction (heart attacks and other heart issues) and even increases in prostate and colorectal cancer. Living in a dark sky area has positive impact on people's connection with their circadian rhythm due to reduced use of unnecessary artificial light and general awareness of this issue.



Protect Wildlife

Plants and animals depend on Earth's daily cycle of light and dark to govern life-sustaining behaviours such as reproduction, feeding, sleep and protection from predators. Scientific evidence suggests that artificial light at night has negative and deadly effects on many creatures⁴, including amphibians, birds, mammals, insects, and plants. Birds for example that migrate (the Hutton Shearwater being a well-documented example) or hunt at night navigate by moonlight and starlight. Artificial lights can cause them to wander off course towards dangerous night-time landscapes of towns. Every year millions of birds die colliding with illuminated buildings. Light pollution is listed as having a significant impact on the quickly dwindling numbers of insects worldwide. The researchers⁵ think streetlights may for example deter nocturnal moths from laying their eggs or put the insects at risk of being spotted and consumed by predators such as bats. In turn, caterpillars that are born under streetlights, particularly LEDs, alter their feeding habits. Simply changing the temperature of outdoor lighting to a dark sky level, and stopping wasteful light spread improves conditions for wildlife.

Making the Communities Safer

Towns, cities, and businesses often install lighting in parks, shopping areas, car parks, and other public places to improve safety. Improperly aimed and poorly shielded lights can actually attract

³ <https://jcsn.aasm.org/doi/epdf/10.5664/jcsn.9642>

⁴ <https://www.theguardian.com/science/commentisfree/2021/apr/07/the-guardian-view-on-dark-skies-we-need-them>

⁵ <https://www.bbc.com/news/science-environment-58333233>

criminals. Property damage may be exacerbated by too many lights, particularly dawn-to-dusk lighting. A study by the city of Chicago⁶ actually found a correlation between increased crime and brightly lit alleyways, extensive material is available on this subject.

Poorly designed lighting on roadways and highways contributes to tragic accidents. Motorists and pedestrians can be temporarily blinded by glare from unshielded streetlights and electronic signs. The problem is more acute for older individuals especially with the glare from modern LED high white streetlights and high powered illuminated bill-boards⁷ (which we are starting to begin to see in Marlborough).

Increase to Tourism

The Omaka Observatory has already shown that there is demand for an astronomy and Maramataka focused tourism and education operation in the region. Working with Destination Marlborough, the creation of a dark skies reserve through the region (especially throughout South Marlborough) would bring tourism and economic benefits to this part of the region.

See attached letter of support from Destination Marlborough.

What are we asking the Council for?

- 1) We are looking to Council to agree that the creation of dark skies reserves / parks / places should be investigated.
- 2) The establishment of a working group to work through what is involved. Parties to be involved would need to include:
 - Omaka Observatory
 - Council staff from environment and planning teams (and any other effected parts of Council).
 - Destination Marlborough

As part of this working group, we would look to Council to provide time from staff to be involved as well as using Council facilities to engage with a sample of rural communities to gauge local commitment.

We would recommend that the working party then report back to council with recommendations of how to proceed, costs and benefits.

- 3) Council to promote dark sky friendly lighting on any replacement or new work being undertaken and on-buildings and car parks by it and its commercial subsidiaries (dark sky friendly lighting should save money in the long run due to less energy use and therefore have a zero-cost impact to the Council).

⁶ <https://www.darksky.org/wp-content/uploads/2021/01/Outdoor-Lighting-Crime-and-Safety-English.pdf>

⁷ <https://www.psychologicalscience.org/news/motr/are-digital-billboards-dangerously-distracting.html>

Signed:

Handwritten signature of Lee Harper in black ink.

Lee Harper
Omaka Observatory Charity Trust

Handwritten signature of Emily Barraclough in black ink.

Emily Barraclough
Omaka Observatory Charity Trust

